PATENT APPLICATION

THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

Frank J.M. Benschop et al.

Confirmation No.: 1170

Application No.: 10/595,471

Examiner: Helene Catherine Bor

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Docket No.: PHNL031299US1

For: DIAGNOSTIC IMAGING SYSTEM WITH USER INTERFACE

BRIEF ON APPEAL

Appeal from Group 3768

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I. REAL PARTY IN INTEREST

The real party in interest for this appeal and the present application is Koninklijke Philips Electronics N.V., by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 017509, Frame 0103.

II. RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings, known to Appellant, Appellant's representative, or the Assignee, that may be related to, or which will directly affect or be directly affected by or have a bearing upon the Board's decision in the pending appeal.

III. SUMMARY OF CLAIMED SUBJECT MATTER

The invention of **claim 9** is directed to a magnetic resonance imaging system (1, 11) (page 7 lines 19-26) comprising: a control system (2) to control the execution of operational items by the magnetic resonance imaging system (page 7 lines 26-32); a user interface (3) coupled to the control system (page 7 line 32-page 8 line 2), the user interface including a scheduler module (4) which generates an ordered selection of operational items for execution controlled by the control system (page 1 lines 28-29; page 2 lines 7-15; page 8 lines 2-6), wherein the scheduler module autonomously orders the operational items by arranging the operational items in said ordered selection of operational items based on respective parameter settings of the operational items (page 3 lines 24-27); and a displaceable patient support (page 5 lines 30-34) wherein the control system is set up to displace the patient support among various imaging stations and conduct several different magnetic resonance imaging sequences at each individual imaging station, the control system grouping all image acquisition sequences to be performed at each individual imaging station together and performing all image acquisition sequences to be performed at each individual imaging station together before the patient support is moved to a next imaging station of the various imaging stations (page 5 line 32-page 6 line 7; page 9 lines 5-19).

The invention of **claim 12** is directed to a diagnostic imaging system comprising: a magnetic resonance imaging system (1, 11) (page 7 lines 19-26); a control system (2) to control the execution of operational items by the magnetic resonance imaging system (page 7 lines 26-32); and a user interface (3) coupled to

the control system (page 7 line 32-page 8 line 2), the user interface including a scheduler module (4) which generates an ordered selection of operational items (page 1 lines 28-29; page 2 lines 7-15; page 8 lines 2-6) autonomously ordered by the scheduler module for execution under control of the control system, the ordered selection being generated by arranging the operational items in said ordered selection of operational items based on parameter settings of the operational items (page 2 lines 26-28; page 3 lines 24-27); wherein the scheduler module is configured to issue instructions to the user prompted by the operational items during the execution of the operational items (page 5 lines 20-29) including an instruction to the user prompted by execution of an operational item calling for applying a surface RF coil (page 5 lines 22-24).

The invention of **claim 15** is directed to a diagnostic imaging system (1, 11) (page 7 lines 19-26) comprising: a control system (2) to control the execution of operational items by the diagnostic imaging system on the basis of an execution list (5) (page 7 lines 26-32); and a user interface (3) coupled to the control system (page 7 line 32-page 8 line 2), the user interface including a scheduler module (4) which generates an ordered selection of operational items (page 1 lines 28-29; page 2 lines 7-15; page 8 lines 2-6), wherein the scheduler module autonomously orders the operational items by arranging the operational items in said ordered selection of operational items based on respective parameter settings of the operational items (page 2 lines 26-28; page 3 lines 24-27), and wherein the scheduler module releases operational items to the execution list according to the ordered selection (page 4 lines 1-5) and provides progress information to the user interface during a diagnostic

imaging session related to the way the execution of operational items is advancing in the diagnostic imaging session in progress (page 2 lines 8-15; page 8 lines 20-33); wherein the scheduler module supports an editing mode in which an operator can edit the autonomously ordered selection of operational items (page 3 lines 27-29; page 5 lines 16-17).

IV. ARGUMENT

A. Claims 4, 5, 7, and 15 are not anticipated by Kamiyama, U.S. Pub. No. 2002/0035326.

Claim 15 stands rejected under 35 U.S.C. § 102(b) as anticipated by Kamiyama, U.S. Pub. No. 2002/0035326 (hereinafter "Kamiyama").

Claim 15 recites a control system to control the execution of operational items by the diagnostic imaging system on the basis of an execution list; and a user interface coupled to the control system, the user interface including a scheduler module which generates an ordered selection of operational items, wherein the scheduler module autonomously orders the operational items by arranging the operational items in said ordered selection of operational items based on respective parameter settings of the operational items, and wherein the scheduler module releases operational items to the execution list according to the ordered selection and provides progress information to the user interface during a diagnostic imaging session related to the way the execution of operational items is advancing in the diagnostic imaging session in progress; wherein the scheduler module supports an editing mode in which an operator can edit the autonomously ordered selection of operational items.

Kamiyama is cited as teaching wherein "the scheduler module support an editing mode [selectable] in which an operator can edit the autonomously ordered selection of operational items (Page 6, Para 0080 and Page 7, Para 0098)." Office Action mailed December 19, 2011 (hereinafter "Office Action) at page 3 (square brackets surrounding "selectable" in original).

Kamiyama discloses a selection device configured to select an activity from the plurality of activities, and a protocol creating unit configured to create work procedure protocols for arranging functions, each of which configures the selected activity in executable order. *See, e.g.*, Kamiyama ¶[0012].

The first paragraph cited in the Office Action relates to selection of the activities, which are then autonomously ordered by the protocol creating unit. The paragraph reads as follows:

> [0080] For example, contrast medium administration techniques include: a Bolus injection technique for administrating the medicine in

the injector in batch for a short time; and an infusion technique for continuously injecting a very small amount of medicine over a long period of time by a specific injector. A certain limitation applies to the administration techniques depending on the diagnosis/analysis protocol. In this work flow system, when the user inputs an administration technique to currently executable, as shown in FIG. 7, selectable diagnosis/analysis protocols and unallowable protocols are explicitly indicated.

Kamiyama ¶[0080].

where Kamiyama Fig. 7:

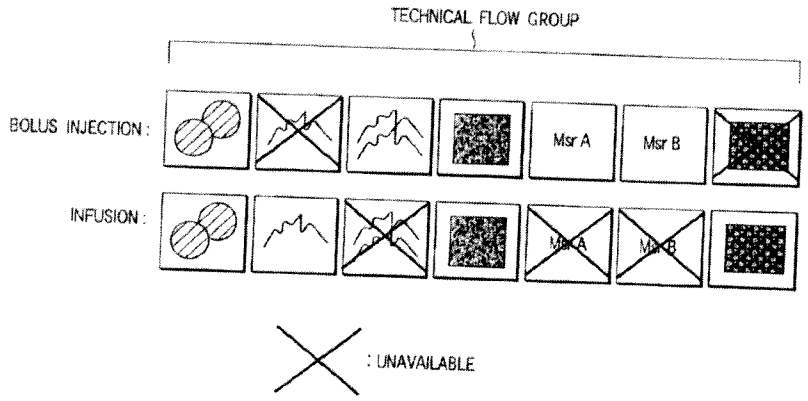


FIG. 7

shows the available activities in the case of administering the contrast agent as a bolus injection and a continuous infusion, respectively. Since the activities are selected *first* and *then* the protocol creating unit performs the autonomous ordering (*see, e.g.*, Kamiyama ¶[0012]), this does not fairly suggest (much less expressly or inherently disclose, as required for anticipation under § 102) *wherein the scheduler module supports an editing mode in which an operator can edit the autonomously ordered selection of operational items.* Indeed, at the point in time of activities selection described in Kamiyama ¶[0080], the autonomously ordered selection of operational items does not yet exist.

The second paragraph of Kamiyama cited as allegedly anticipating the editing mode recitation of claim 15 reads as follows:

> [0098] (2) In the second embodiment, it is possible to execute processing by eliminating some activities from among the reorganized sequences. In this manner, there can be provided a so called rehearsal function that makes it possible to practice manipulation before a contrast medium is actually administered to a patient, for example. Although the activities targeted for such elimination specifically include indication for contrast medium injector and image recording or the like, of course, these activities can be arbitrarily selected by the operator. Kamiyama ¶[0098].

This passage is more relevant than ¶[0080] insofar as it pertains to operations performed after the autonomously ordered selection of operational items is created by the protocol creating unit. While not a model of clarity, ¶[0098] appears to describe updating the autonomously ordered selection of operational items responsive to eliminating some activities.

However, ¶[0098] does not fairly suggest (much less expressly or inherently disclose, as required for anticipation under § 102) *an editing mode in which an operator can edit the autonomously ordered selection of operational items.* At most, the user may identify activities to be eliminated (even this is not expressly stated, but the rehearsal function suggests some sort of user involvement in selecting activities for elimination). The selection causes the system to "execute processing" (explicitly: "it is possible to execute processing by eliminating some activities"). What that executed processing does is not expressly stated, but a reasonable guess might be that the executed processing outputs an updated autonomously ordered selection of operational items that does not include the eliminated activities.

Accordingly, Appellants urge reversal of the anticipation rejection of claim 15, and of claims 4, 5, and 7 depending therefrom.

B. Claims 12 and 13 patentably distinguish over the proposed combination of Bis et al., U.S. Pat. No. 6,493,571 and Kamiyama, U.S. Pub. No. 2002/0035326.

Claim 12 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Bis et al., U.S. Pat. No. 6,493,571 (hereinafter "Bis") in view of Kamiyama, U.S. Pub. No. 2002/0035326 (hereinafter "Kamiyama").

Claim 12 recites the scheduler module is arranged to issue instructions to the user prompted by the operational items during the execution of the operational items including an instruction to the user prompted by execution of an operational item calling for applying a surface RF coil.

In rejecting claim 12, Bis is relied upon as disclosing surface coils in order to obtain high resolution images. Office Action page 6 (*citing* Bis claim 3; col. 2 lines 49-54). Bis does indeed disclose surface coils, for example in Bis claim 3 as cited in the Office Action.

However, the proposed combination of Bis and Kamiyama does not disclose or fairly suggest a scheduler module arranged to issue an instruction to the user prompted by execution of an operational item calling for applying a surface RF coil. Kamayama does not teach coils. Office Action page 6. Bis teaches *fixed* lower and upper surface coils (50, 62) mounted on the imaging table (24) at the examination region the MR scanner, and a movable examination table (40) that carries the imaging subject and slides in-between the lower and upper surface coils (50, 62). *See* Bis Fig. 2; col. 4 lines 11-54.

Why does Bis use this arrangement? Precisely in order to *avoid* the need for a user to apply a surface coil. As explained in Bis:

> With current MRI systems, when an anatomical location is completely imaged, the table and patient are then moved centering a different anatomical location in the center of the magnetic field. Using conventional techniques, this requires a considerable amount of time including moving the surface coils that are placed anterior and posterior to the body to be properly aligned with the different anatomical location as well as the center of the magnetic field.
>
> Bis col. 5 lines 34-41.

> Using the kinematic imaging table according to the medical procedures of the present invention, when the imaging of one anatomical location is complete (imaging time with current MRA software requires approximately 15-25 seconds), the table can be moved in either a manual or automatic fashion to center the second anatomical location within the center of the magnetic field and relative to the anterior and posterior coils.
>
> Bis. col.5 lines 50-57.

The Kamiyama/Bis combination teaches away from providing a scheduler module arranged to issue an instruction to the user prompted by execution of an operational item calling for applying a surface RF coil. Although Kamiyama may disclose a scheduler that issues instructions to the user, Kamiyama does not disclose surface coils at all, and Bis teaches using *fixed* surface coils disposed at the center of the magnetic field so that the user does not have to apply a surface RF coil *at all.*

In response to the foregoing (the substance of which was presented in previous Amendment G), the Office Action argues that Bis in effect "applies" the fixed surface RF coils (50, 62) when the patient is moved into the examination region. It is respectfully submitted that the skilled artisan would not consider this to be applying the surface RF coil any more than the skilled artisan would consider moving the patient into the examination region to constitute "applying" the magnetic field gradient coils.

Moreover, claim 12 does not merely call for applying a surface RF coil. Rather, claim 12 recites the scheduler module is arranged to *issue an instruction to the user prompted by execution of an operational item calling for applying a surface RF coil.* In the Bis system, there would be no operational item calling for applying a surface RF coil, because the fixed surface RF coils (50, 62) are automatically applied when the patient is loaded into the MR scanner. Therefore, there can be no instruction to the user prompted by this non-existent operational item.

Accordingly, Appellants urge reversal of the § 103(a) rejection of 12, and of claim 13 depending therefrom.

C. Claims 3, 8, and 9 patentably distinguish over the proposed combination of Bis et al., U.S. Pat. No. 6,493,571 and Kamiyama, U.S. Pub. No. 2002/0035326.

Claim 9 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Bis et al., U.S. Pat. No. 6,493,571 (hereinafter "Bis") in view of Kamiyama, U.S. Pub. No. 2002/0035326 (hereinafter "Kamiyama").

Claim 9 recites the control system is set up to displace the patient support among various imaging stations and conduct several different magnetic resonance imaging sequences at each individual imaging station, the control system grouping all image acquisition sequences to be performed at each individual imaging station together and performing all image acquisition sequences to be performed at each individual imaging station together before the patient support is moved to a next imaging station of the various imaging stations.

In rejecting claim 9, Bis is cited as disclosing "the control system capable of grouping all image acquisition sequences to be performed at each individual imaging station together and performing all image acquisition sequences to be performed at each individual imaging station together before the patient support is moved to a next station of the various imaging stations (Figure 8)." Office Action pages 4-5.

Cited Bis Fig. 8 is reproduced below:

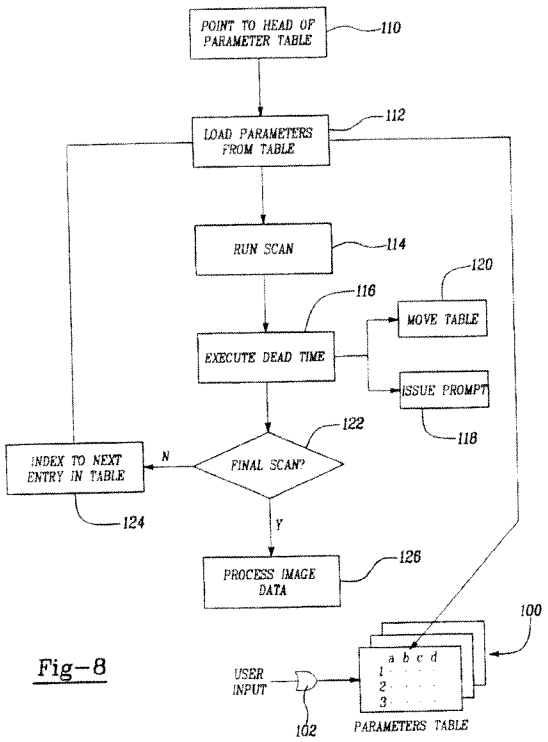


Fig-8

Bis discloses running a scan (114) followed by dead time (116) during which the table is moved (120) to the next station and flow iterates (124). Fig. 8 shows Bis running only a single scan at each station. This is consistent with the purpose of Bis' multistation imaging, which is to perform MR angiography (MRA) at, e.g. two body parts with only a single bolus injection. Bis col. 2 lines 61-67. This is achieved by moving from one body part (i.e., imaging station) to the next "within a predetermined amount of time corresponding to travel of said contrast material from said first body portion to said second body portion". Bis claim 1; see also col. 7 lines 24-29. There is no fair suggestion of conducting several different magnetic resonance imaging sequences at each individual imaging station, and indeed movement from body part to body part (i.e., station to station) would need to be rapid in order to keep pace with blood flow through the body, leaving little time at each station to conduct multiple sequences.

In response to the foregoing (the substance of which was presented in previous Amendment G), the Office Action further cites Bis claim 9 (reciting injecting [a] patient with a contrast material; performing a first scan sequence ... to obtain a first image of a body portion; and performing a second scan sequence ... to obtain a second image of said body portion at a different orientation from said first scan sequence. However, claim 9 (and claim 10 depending therefrom) is *single*-stage imaging, not multi-stage imaging.

On the other hand, Bis claim 1 recites injecting said patient with a contrast material; performing a first scan sequence of a first body portion ... moving said patient to a second position ... and performing a second scan sequence of a second body portion with said magnetic resonance imaging machine within a predetermined amount of time corresponding to travel of said contrast material from said first body portion to said second body portion. This is multi-stage imaging. But claim 1 (and claims 2-8 depending therefrom) does not call for conducting different magnetic resonance imaging sequences at each individual imaging station.

The Office Action also further cites disclosure that MRI can perform different types of MRI techniques and that Bis teaches other imaging sequences can be implemented, and argues that there is nothing within Bis that prevents the MRI from conducting several different MRI imaging sequences at each individual imaging station. Office Action pages 7-8.

However, Bis spends much of its text emphasizing the time constraint imposed on imaging data acquisition by the rapid dissipation of its bolus injection. Bis discloses placing fixed surface RF coils at the MR examination region in order to speed the imaging process, and teaches that the delay time between imaging at successive stations in multi-station imaging is controlled by the travel time of the contrast material from one station to the next. *See, e.g.* Bis claim 1, last sub-paragraph.

The question is what one skilled in the art would learn from Bis, and/or what Bis would motivate the skilled artisan to do. The skilled artisan reading Bis would not learn of conducting several different MRI imaging sequences at each individual imaging station of a multi-station imaging session. The skilled artisan also would not be motivated by Bis to conduct several different MRI imaging sequences at each individual imaging station of a multi-station imaging session.

Finally, the Office Action argues that "MR angiography that is disclosed in Bis is also the same procedure as disclosed by the Applicant (Page 2 Line 16-20)." Office Action page 8. But it does not follow either that (1) Bis teaches conducting several different MRI imaging sequences at each individual imaging station of a multi-station imaging session or that (2) the skilled artisan would be motivated by Bis to reach claim 9.

Accordingly, Appellants urge reversal of the § 103(a) rejection of 9, and of claims 3 and 8 depending therefrom.

D. Claim 10 patentably distinguishes over the proposed combination of Kamiyama, U.S. Pub. No. 2002/0035326 and Becker, U.S. Pat. No. 6,094,161.

Claim 10 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Kamiyama, U.S. Pub. No. 2002/0035326 (hereinafter "Kamiyama") in view of Becker, U.S. Pat. No. 6,094,161 (hereinafter "Becker").

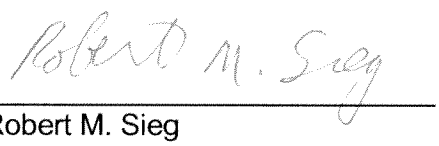
Claim 10 depends from and incorporate all limitations of base claim 15. As set forth in Section A, Kamiyama does not fairly suggest the subject matter of claim 15. The Office Action does not allege that Becker addresses any of the deficiencies of Kamiyama identified in Section A, but rather merely cites Becker as disclosing a magnetic resonance imaging system. Office Action page 7.

Accordingly, Appellants urge reversal of the § 103(a) rejection of 10.

CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that the rejections are in error and that all pending claims 3-5, 7-10, 12, 13, and 15 are in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the all pending rejections of the appealed claims.

Respectfully submitted,



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APPENDICES

V. CLAIMS APPENDIX

Claims involved in the Appeal are as follows:

3. A magnetic resonance imaging system as claimed in claim 9, wherein the control system controls the execution of operational items on the basis of an execution list and the scheduler releases operational items according to the ordered selection.

4. A diagnostic imaging system as claimed in claim 15, wherein the scheduler module releases operational items in dependence of successful completion of preceding operational items of the ordered selection.

5. A diagnostic imaging system as claimed in claim 15, wherein the scheduler module is provided with a memory, in particular a database with a browser, to store scan schedules.

7. A diagnostic imaging system as claimed in claim 15, wherein the scheduler module is arranged to make available to the user interface a description of the operational item being released to the execution list.

8. A magnetic resonance imaging system as claimed in claim 3, wherein the scheduler module is arranged to provide progress information to the user interface, said progress information being related to the way the execution of operational items is advancing.

9. A magnetic resonance imaging system comprising:

a control system to control the execution of operational items by the magnetic resonance imaging system;

a user interface coupled to the control system, the user interface including a scheduler module which generates an ordered selection of operational items for execution controlled by the control system, wherein the scheduler module autonomously orders the operational items by arranging the operational items in said ordered selection of operational items based on respective parameter settings of the operational items; and

a displaceable patient support;

wherein the control system is set up to displace the patient support among various imaging stations and conduct several different magnetic resonance imaging sequences at each individual imaging station, the control system grouping all image acquisition sequences to be performed at each individual imaging station together and performing all image acquisition sequences to be performed at each individual imaging station together before the patient support is moved to a next imaging station of the various imaging stations.

10. The diagnostic imaging system as claimed in claim 15, wherein the diagnostic imaging system is a magnetic resonance imaging system.

12. A diagnostic imaging system comprising:

a magnetic resonance imaging system;

a control system to control the execution of operational items by the magnetic resonance imaging system; and

a user interface coupled to the control system, the user interface including a scheduler module which generates an ordered selection of operational items autonomously ordered by the scheduler module for execution under control of the control system, the ordered selection being generated by arranging the operational items in said ordered selection of operational items based on parameter settings of the operational items;

wherein the scheduler module is arranged to issue instructions to the user prompted by the operational items during the execution of the operational items (page 5 lines 20-29) including an instruction to the user prompted by execution of an operational item calling for applying a surface RF coil.

13. The diagnostic imaging system as claimed in claim 12, wherein the scheduler module is arranged to issue an instruction to the user prompted by execution of an operational item calling for infusion of contrast agent.

15. A diagnostic imaging system comprising:

a control system to control the execution of operational items by the diagnostic imaging system on the basis of an execution list; and

a user interface coupled to the control system, the user interface including a scheduler module which generates an ordered selection of operational items, wherein the scheduler module autonomously orders the operational items by arranging the operational items in said ordered selection of operational items based on respective parameter settings of the operational items, and wherein the scheduler

module releases operational items to the execution list according to the ordered selection and provides progress information to the user interface during a diagnostic imaging session related to the way the execution of operational items is advancing in the diagnostic imaging session in progress;

wherein the scheduler module supports an editing mode in which an operator can edit the autonomously ordered selection of operational items.

VI. EVIDENCE APPENDIX

NONE